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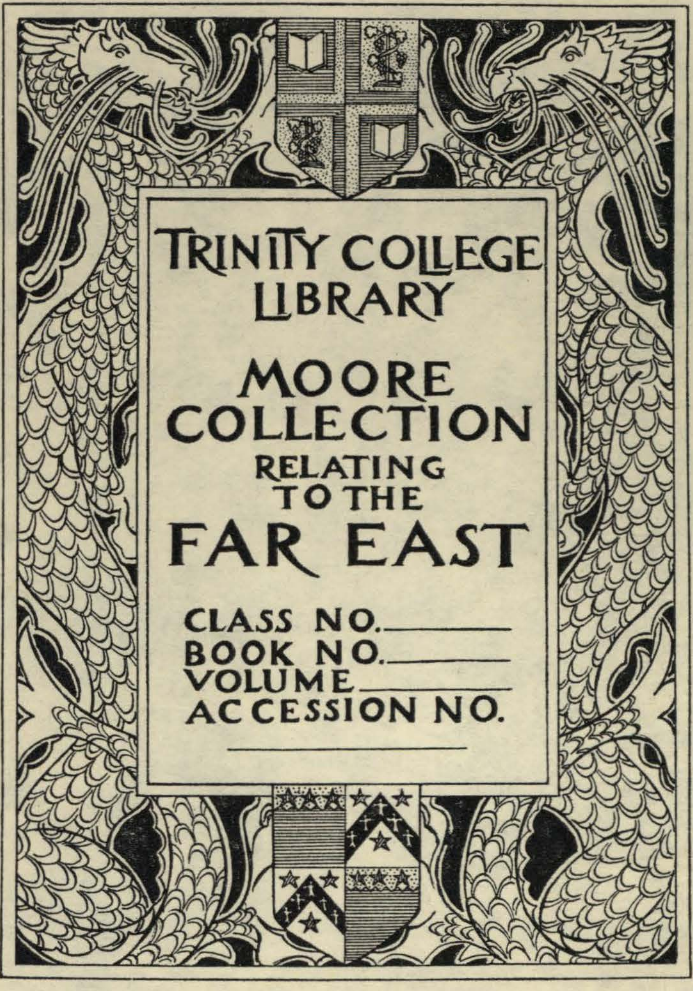

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The Potteries at Shek Waan, Near Canton, China

By Clinton N. Laird

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THE POTTERIES AT SHEK WAAN, NEAR CANTON, CHINA

By Clinton N. Laird

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The prevalence of white ants in South China restricts the use of wood as a building material to a minimum, and therefore all but the most temporary structures are built of brick with tile roofs. The bricks used range from sun-dried, in the poorest villages, to well-burned gray or red of various dimensions. They are made at many different places. The tile are of two kinds, a pan tile, 9 in. square, curved like a shallow trough, and a round tile, approximately half of a truncated cone. The latter are laid in rows over the joint between the vertical rows of overlapping pan tile. These round tile are often glazed but the pan tile very rarely. Most of the common unglazed tile, of different grades, used in and near Canton, are made in Fa Uen district, about 30 miles north of Canton. The only place where any glazed roof or fancy tile or other glazed earthenware articles are made in South China is at the village of Shek Waan, about 20 miles west of Canton.

The pottery industry there is said to be over 700 years old. When the process for glazing earthenware was developed is not recorded, but as one of the temples in Canton has a glazed tile roof (never relaid and still in good condition) known to have been laid 400 years ago, the process is not one of recent origin. At this village are made earthenware jars and dishes of all kinds, clay idols and figures of men and animals, and, in recent years, tile pipe, as well as the glazed ware of many kinds, in color chiefly brown, green, blue and yellow.

For some unknown reason or reasons, possibly through consideration of both beauty and expense, the use of colored glazed roof tile was restricted long ago to temples and imperial buildings. Other blue and green articles made of the same materials in the same way have had a wide use in private buildings, and after the First Revolution (1911) the restriction on the use of glazed roof tiles was removed. General use, except by foreigners, will probably not become common for many years, however, because of the strong association between the tiles and temples. I have been told by one who has travelled widely in the interior of China, that the only place he has seen the green roof tile used on buildings other than temples is at Peking where they are used on the tombs of the imperial concubines. The imperial buildings in Peking and the imperial temples throughout China were the only buildings having yellow tiled roofs.

The original deposits of clay at Shek Waan were exhausted long ago, and now all the materials are imported. The clay, which varies in color from a cream, streaked with red, to a dark gray, comes from two places, the more plastic from Tung Koon district, about 40 miles east of Canton, and the stiffer from Fa Uen district where the ordinary tiles are made. It is all bought at Shek Waan of the people who bring it there in boats from the districts named. The fuel used is wood, which comes down the river in rafts from the province to the west. It is cut to size and dried across the river from the village of Shek Waan. The potteries are low, one story structures, cheaply built and poorly lighted, but the workers are protected from the heat and glare of the tropical sun.

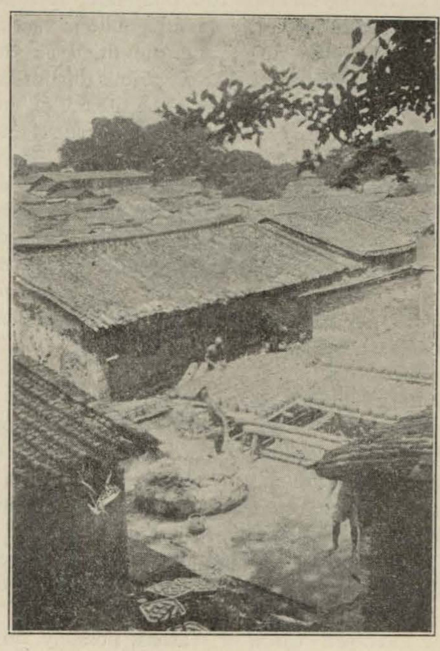

FIG. 1—THE MIXING MACHINE[1]

The article to be made will determine the relative proportions of the two kinds of clay used in any batch. Sand is mixed with the clay in the proportions of one part sand to four parts clay to lessen the danger of cracking in the firing. Nearly 2300 pounds of clay and sand are mixed at a time by one man who mixes it with his feet, by tramping on it, adding a little water from time to time to make it work easier. This is said to be the original method, and the workmen claim that it can be done more thoroughly this way than by machinery. Two batches are mixed by each man in a day, working 4 hrs. on each batch. Large lumps of clay, when mixed, are stuck up against a wall to dry for a day or two, depending on the weather, before being ready for use.

[1] Because of the Chinese superstition that a man will never be able to do a kind of work different from that which he was doing when his picture was taken, it is very difficult to get satisfactory pictures of the men at work.

Three methods are used at these potteries for making the various articles: some are formed on the wheel, others in a mold, and some are modeled by hand. They are glazed in practically the same way and all are burned in the same kind of kiln. The chief articles made on the wheel are earthenware dishes, pots used in cooking, and covers for certain kinds of jars. The clay comes to the potter wet. His wheel, nearly 2 ft. in diameter, is mounted on a pin which rotates in a block set in the ground so that the upper surface of the wheel is only a few inches from the ground. The potter sits on a low stool. At his left, close to the wheel, is a flat dish about 10 in. in diameter, partly filled with rice straw ashes, and at his right, also close to the wheel, is a vessel containing water. With his left hand he picks up a ball of clay from the dish and with his right hand dips up a little water to moisten the clay. The wet clay is then put on the wheel which is turned by his assistant. Working from the center out he shapes the vessel, holding his thumbs in and his fingers out. The assistant, generally a boy, propels the wheel by striking its upper surface with his right foot as he swings it back, a running motion. Before giving the first impulse to the wheel he picks up a lump of clay which he rolls into a ball while kicking the wheel. He then throws the ball into the dish at the potter's left on to the gritty ashes which make the bottom of the vessel, when finished, a little rough so that it will not stick to the wheel. The boy then takes a piece of flexible bamboo which he holds between his hands in the shape of a U. This acts as a spring to help keep his hands far enough apart so that he will not deform the dish as he picks it up from the wheel and sets it on a board. When the wheel is empty the potter puts on another lump of clay and begins working it. As soon as the boy has put down one dish he picks up another lump of clay and begins kicking the wheel again. The performance is repeated until the board is full, when work stops while the boy puts the board up into a rack over head where the

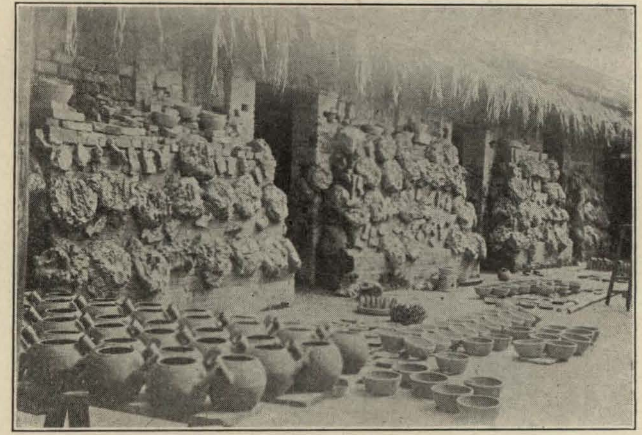

FIG. 2—THE DRYING ROOM

dishes dry until the next day. They are then put out into the sun. I have seen the simplest form of dish, about $1^1/_2$ in. deep and 6 in. in diameter made in 8 sec., though this would be under the average time. A day's work for the pair would be 1500 or more of these dishes. Larger vessels take more time, and more kicking by the boy who has no chance to kick with his left leg occasionally for a change.

These earthenware dishes, used chiefly in the household, are glazed only on the inside. The glazing material is wood or rice straw ashes, mud from the river bottom (the fouler, the better, according to the workmen), and water, forming a muddy cream. Some of this is poured into the sun-dried dish, and, with a short turning motion, most of the inside of the dish is covered with the cream. The rest is poured out. The dish is allowed to dry before being taken to the kiln to be fired. The final color, after burning, is a dark brown.

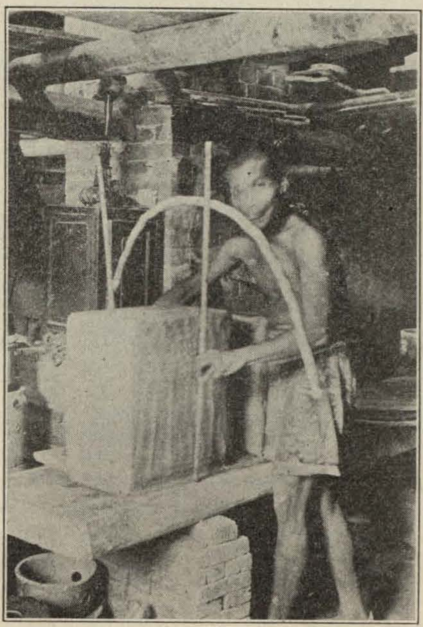

FIG. 3—CUTTING SLICES OF CLAY FOR USE IN THE MOLDS

All the jars, roof and window tiles, tile pipe, etc., are formed in molds. A wooden model is first made and from it the clay mold. This is burned from 4 to 6 hrs. in a moderate fire; too hot a fire will ruin the mold. The clay is worked stiff and shaped into a large lump with straight sides of such a shape that a slice cut transversely through the lump for use in the mold will be of the right shape and dimensions for the particular article to be made. This lump is placed on a smooth table and cut into slices from $^1/_4$ in. to $^3/_8$ in. thick. The workman then selects two flat bamboo sticks, notched on the sides at the proper intervals, and, holding in those notches a wire kept tight by a bow, pulls the whole towards him through the lump of clay, the bottom ends of the guides sliding along the table. He then drops the wire down a notch and cuts another slice, thus working from top to bottom through the lump.

The slice of clay is placed in the mold and pressed into position with the fingers. Then it is taken from the mold and sun-dried for 2 hrs. If the article is, say, a lattice work tile to be used in windows instead of glass, the two complementary pieces are then put carefully together and all joints made smooth and tight with a little clay put on with the fingers or a bamboo tool. Jars, smaller at the top and bottom than in the middle are made of five pieces of clay. The lower half is made in one mold of a bottom and two side pieces, the edges being pressed together with the fingers; the upper half is formed in another mold. The two sections, after partially drying in the sun, are put together and the joint made tight. These articles are then ready to be glazed and burned.

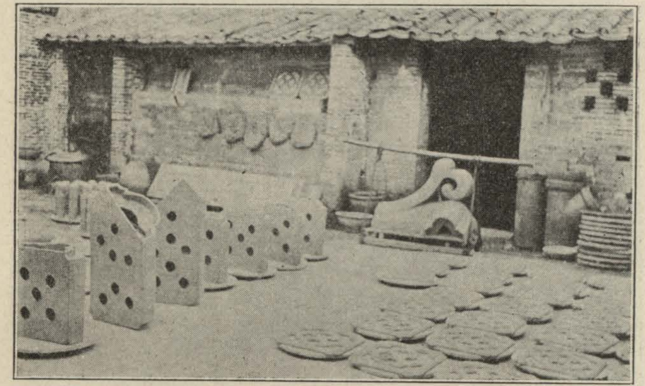

FIG. 4—THE YARD OUTSIDE A POTTERY. NOTE LUMPS OF CLAY DRYING ON THE WALL, AND MOLDS FOR LATTICE WORK TILE ABOVE THEM; ALSO DRYING IN THE SUN, HALVES OF THE LATTICE WORK TILE, LARGE TILE FOR A RIDGE POLE, AND SMALL IMITATION BAMBOO TILE

Glazes of three colors are common: green, blue, and yellow. Copper is used to get the green and cobalt for the blue. One of the leading tile manufacturers in the village told me that they add lead to get the yellow. The same man informed me that they had always made their own copper oxide by roasting copper, but I have never been permitted to see how they do it. The cobalt is imported under the name "English green" and costs more than the copper, but the yellow is the most expensive color of all, which probably explains why the only yellow articles made are roof tile for imperial buildings and burial urns.

The glazing mixture is made of powdered glass, ashes of either mulberry bushes or rice straw, and the coloring matter, all stirred up in water to form a thick, black cream. This is kept in large jars near the kilns and the articles to be glazed are dipped a short time before being stacked in the kilns. The coating is not uniform in thickness, as the glaze runs somewhat, giving a difference of shade, if the color is green, in the final product. This is not noticeable in the roof tile when laid, but is objectionable in other articles. Some of the green tile will show spots or streaks of blue if the firing is not done properly, but generally the color is nearly uniform in the green and quite satisfactory in both the blue and the yellow. Salt is not used in any of the glazes.

The articles modeled by hand are of three classes. Small birds, animals, figures of people, teapots, etc., are modeled by hand, some of solid lumps of clay, and are burned at the bottom of the kiln used for all the other articles. The fancy glazed tile of unusual shape or size are made by hand without a mold but often forms for curves, etc., are used. These are then treated the same as the regular tile. The third kind are the figures and grotesque decorations used on buildings. Some of these are sun-dried, painted, and then burned like the ordinary tile; others are burned without being glazed and then painted or otherwise decorated. They do not have the life of the glazed articles, but the purpose for which they are intended, or the style of decoration, prevents firing after the decoration has been put on.

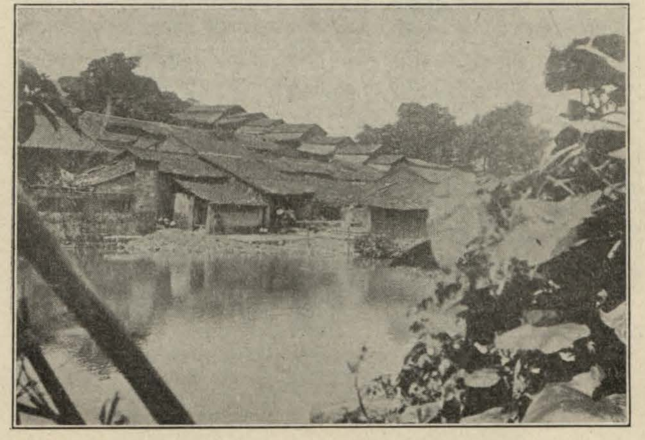

FIG. 5—ROOF OVER A KILN SHOWING OVER THE HOUSETOPS

The most novel feature of the whole process is the kiln. There are seventy of these in the village. They are long tube-like structures, up to 200 ft. long, built on the sides of the hills in the village. As the hills slope at an angle of from 15° to 20°, (the angle may not be the same all the way up), the kilns are really long inclined chimneys. At any place a cross section will be an inverted U. Each kiln is protected from the sun and weather by a low roof, built in a series of steps to allow of better ventilation, supported on pillars without walls. Thatched palm leaf awnings are hung at the sides in summer time for further protection from the sun.

One long kiln was only 3 ft. 4 in. wide and 3 ft. 4 in. high, inside measurements, at the bottom. The dimensions gradually increase towards the top where the kiln was 6 ft. wide and 7 ft. high in the center, also inside measurements. The walls are 8 in. thick, made of vitrified brick locally burned for the purpose. Access to the kiln is secured through openings in the sides, 20 to 24 in. wide by 3 ft. high at the lowest opening, gradually increasing in height to 5 ft. at the opening nearest the upper end. The openings are bricked up when the kiln is being fired. The articles to be burned are stacked on the sloping floor, boys doing the work where the kiln is small, each pile having some old broken burned pieces on top. At every 30 in. up the top of the kiln are transverse rows of holes, each not over 2 in. in diameter, through the top wall into the kiln. There are 3 holes in each row near the bottom and 5 holes in each row at the top. The holes are generally closed with pieces of brick set in loosely.

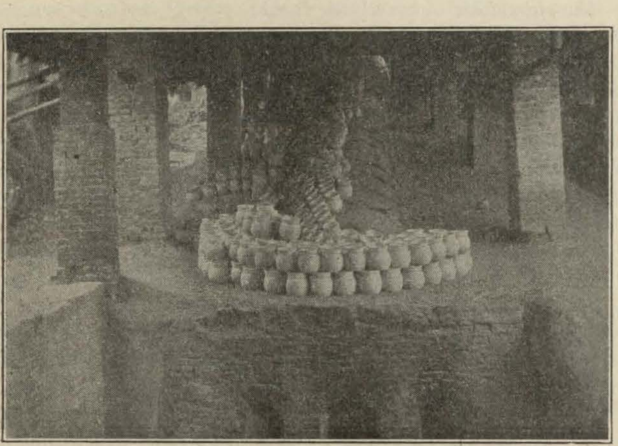

FIG. 6—LOWER END OF A KILN, SHOWING FIRE PIT, HOLES IN TOP THROUGH WHICH FUEL IS FED, AND VESSELS DRYING OUT FOR THE NEXT RUN

The fuel used is wood. A fire is built at the bottom and the smoke goes up through the kiln, warming the ware therein. When the fire is hot enough and sufficient draft has been created, no more fuel is added to the fire at the bottom, but the burners take their places at the first row of transverse holes and feed the fire by dropping in pieces of wood about 15 in. long. When the master burner thinks the fire is hot enough the burners move to the next row and add more fuel. The fire is thus fed through each row of holes all the way to the top. It takes 2700 lbs. of wood and 12 hrs. work to fire a long kiln. As the fire at the bottom goes out before long, the cheaper articles which do not require much heat, or these that would be spoiled by too much heat, are packed near the bottom. The top of the kiln heats more slowly, becomes much hotter, and cools more slowly so the better grades, like the colored glazed ware, are burned in the upper part of the kiln, and only in a long kiln.

Following the burners and their helpers, the woodcarriers, come another set of men who put the articles for the next run on top of and beside the kiln to be dried out thoroughly before being fired. (When the accompanying picture (Fig. 6) was taken the packers, working from one side, had taken off half of the articles to put them in the kiln.) A kiln is packed on the first day, fired on the second, allowed to cool over the third, and is unpacked on the fourth day; but ordinarily the packers for the next run are following close on the heels of those who are unpacking the previous run, both crews beginning at the bottom and working up the kiln. A large kiln will hold up to 10,000 articles at a time. If 80 per cent of the articles fired are marketable, the yield is said to be good. The kilns are not owned by the shops which employ the labor and make the goods, but must be rented at the rate of $5.00 for each un, renter to furnish fuel and labor.

The population of the village is said to be 15,000. As is usual at industrial centers, most of the men have left their families back in the country villages, so the statement that two-thirds of the people there are men and boys is not an exaggeration. The only industry in the village is the potteries, with the necessary shops that supply food, clothing, etc. There are a few women working in the potteries, chiefly at tasks like luting together the halves of a fancy tile. They also make most of the small figures, but this modeling work is done in their homes.

The workmen are well organized, there being at least sixteen guilds or local unions of the men. The men doing the same kind of work belong to the same guild—there are four guilds of men working on the wheel, the members of each guild making a different article. It is difficult to get accurate general information as no one can speak with authority about conditions in other guilds, and he does not care to tell much about his own. A man must serve an apprenticeship of six years, during which time he is said not to receive any wages (this may mean no cash, though he may get both food and lodging), before he is admitted to the guild. A fee of $75 must be paid the guild at the time of joining, but this is generally paid by the shop or employing company. The wages run up to 40 cents a day for skilled potters (a good carpenter in Canton will get only 25 to 30 cents a day), most of whom are paid by piece work. A semi-skilled workman gets $4.00 a month and his food, and the boys about a dollar a month and food. Any of the workmen can rise to be an employer if he can get a little capital. The employers, too, have their guild house, said to be a very fine one.

These potteries are typical of most of the native industries of China in state of development, ingenuity and skill of her artisans, and labor conditions. This description should also suggest the opportunity in China for American goods. At the present time those interested in reaching this market will probably do best to deal through the foreign (chiefly European) firms established in the port cities, who may, or may not, be interested in pushing American lines.

The future growth of the industries of China may be along one of two lines: either the native industries may be developed along modern scientific lines, or the effort may be made to completely ignore the native industry and establish a foreign industry using a foreign process, foreign machinery, and foreign methods. The latter method will almost certainly fail when applied to most industries at most places because of cheap labor, the close relationship between the guilds of both workmen and merchants, and the fact that the market is conservative and demands, in general, a low-priced article. In lines where there has been no native industry it will be necessary to introduce foreign methods, but full recognition must be paid to economic, social, and labor conditions in adapting the foreign process to the local situation.

Those Chinese who have been educated either in the United States, Europe, or the few modern schools in China will be the ones best fitted to develop China's industries. Being conversant with both local conditions and western science and practice they will be able to so remodel the industries that the good points will be conserved, no prejudices aroused, and scientific results obtained. British firms have equipped the engineering laboratories at the University of Hongkong with British machinery, thus training the students at that institution to prefer British goods in future years. So far-sighted Americans, looking for future business in China, should see that American institutions in China lack no facilities for advancing American methods and products, and that at least those Chinese who are studying chemistry in the United States are persuaded to join the AMERICAN CHEMICAL SOCIETY. Those who join will be kept in later years conversant with scientific developments in America and be able, through the advertisements, to know where to get the supplies they need in their own work. The advantages to both countries are unlimited in having an enthusiastic body of Chinese who admire the United States and turn first to Americans when in need.

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